

WE CLAIM:

1. A device for separating the epithelial layer of a cornea, the device comprising:

5 a separator having an edge, wherein the edge comprises a thickness thicker than the thickness of at least one epithelial cell and less thick than the thickness of the epithelial layer.

2. The device of claim 1 wherein the separator comprises a blade having a bent edge.

3. The device of claim 1 wherein the separator comprises a wire.

10 4. The device of claim 1 wherein the edge of the separator comprises approximately a trapezoid shape including a flat front edge.

5. The device of claim 4 wherein the flat front edge comprises a thickness of between about 5 and 25 micrometers.

15 6. The device of claim 1 wherein the edge of the separator comprises an approximately semi-cylindrical surface including a front edge.

7. The device of claim 6 wherein the semi-circular surface comprises a radius of between about 2 and 13 micrometers.

8. The device of claim 1 wherein the edge comprises a bent front edge to form a shape resembling a semicircle.

20 9. The device of claim 8 wherein the semicircular edge comprises a diameter of between about 5 and 25 micrometers.

10. The device of claim 1 wherein the separator comprises an elliptical shaped wire.

25 11. The device of claim 10 wherein the edge that is used for separating comprises a thickness from about 5 to about 25 micrometers.

12. The device of claim 1 wherein the separator comprises a circular shaped wire.

13. The device of claim 12 wherein the edge that is used for separating comprises a width from about 5 to about 25 micrometers.

5 14. A substrate for substantially preserving an epithelial layer of eye, wherein the substrate comprises:

a film having a first surface, wherein the first surface is constructed to adhere to the epithelial layer to provide mechanical stability to the epithelial layer that is separated from the eye.

10 15. The substrate of claim 14 wherein the film comprises a natural polymer.

16. The substrate of claim 14 wherein the film comprises a synthetic polymer.

15 17. The substrate of claim 14 wherein the film comprises a thickness from about 20 to about 100 micrometers.

18. The substrate of claim 14, wherein the film comprises the shape of a strip.

20 19. The substrate of claim 18, wherein the strip comprises a length and a width that is longer and wider than the diameter of a separated epithelium layer.

20. The substrate of claim 14 wherein the film comprises a HEMA material.

21. The substrate of claim 14 wherein the film comprises the shape of a disc.

25 22. The substrate of claim 21 wherein the disc comprises a HEMA material.

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23. The substrate of claim 14 wherein a hydration level of the film controls adhesion to the film.

24. The substrate of claim 14 wherein the film is applied and adhered to the epithelium layer before the epithelium layer is removed from the eye.

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